Insensitive Munitions Solutions
For
Projectiles Crimped
To
Cartridges for Artillery Application
Carl J. Campagnuolo, PhD*
William J. Andrews

US Special Operation Command
PEO SOF WARRIOR SYSTEMS
Colonel Kevin S. Noonan
Approved by: US SOCOM Public Affairs Office
* Presenter
Cartridge Cases with Venting Holes
Slow Cook-off Test

**Before**

30, 3/8 inch holes in cartridge case

**Second Test**

Fragment, 4 feet from oven

**After**
Slow Cook-off Test

First Test

Cartridge case with 6, \( \frac{3}{4} \) inch holes

Fragment, 30 feet from oven
Fast Cook-off Test

Cartridge With 30, 3/4 inch Holes
Test #2

Cartridges, after the test remained on the pit
Modified Slow Cook-Off Test

- Thermal Gasket on Primer
- Cartridge case with 6 holes in Slow Cook-Off oven
Where to Next?

- Explosive!!
- PBXN-109 has been selected as the explosive for the PGU 44/B
- A new Initial Capability Document (ICD) requires a blast output as well as lethality when firing the PGU 44/B inside a building
- PBXN 109 meets the ICD requirement and IM Insensitive criteria
- Gun firing were conducted at Eglin AFB in March 07 to determine blast output, pressure and gun survivability
- Thermal tests with AUR will be conducted later in FY 07
105 MM Gun Firing Test

105 MM Projectile and Breech

105 MM Gun
PBXN-109 Fuze Set PD
PBXN-109 Fuze Set PD Delay
Comp B Fuze Set in PD Mode
PBXN-109 Fuze Set PD

Same target as Comp B
Comp B on Left
PBXN-109 to the Right

Comparison Test
Plugs in Cartridge Case

Before Firing
PBXN-109 with Polyurethane Liquid Plugs in Base of Cartridge
Plugs in Cartridge Case

After Firing
Plugs in Cartridge Case
Liquid Polyurethane

Before Firing
PBXN-109 with Polyurethane Plugs in Base of Cartridge
Plugs in Cartridge Case
Liquid Polyurethane

After Firing
Inside View of Cartridge Case with Liquid Polyurethane

After Firing
Inside View of Cartridge Case with Polyurethane Plugs

After Firing
Polyurethane Plug

Machined Plug, After firing
What’s Next?

• Conduct a full up round test with vented cartridge case (including venting plugs and projectiles filled with PBXN-109).

• Prepare a SOW to purchase 105 mm cartridges to conduct a full qualification test in FY 08.